

## 7<sup>th</sup> Grade Science Curriculum Guide

<b>Course Name:</b> 7 <sup>th</sup> Grade Science		<b>Strand:</b> Scientific Inquiry
<b>Unit Title:</b> Scientific Inquiry		<b>Number of Days:</b> 8
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will remember the steps of the scientific method and explain each step with key terms.</li><li>• Students will define independent variables, dependent variables and a control.</li><li>• Students will identify independent variables, dependent variables and a control in a given experiment.</li><li>• Students will define observation, inference, qualitative data, and quantitative data.</li><li>• Students will apply the terms observation, inference, qualitative data, and quantitative data to examples.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Scientific Method Activities – including Spongebob Experiments <a href="http://www.sciencespot.net/Pages/classgen.html">http://www.sciencespot.net/Pages/classgen.html</a>  <i>See Science Wiki for documents and more activities/resources.</i></li></ul>
<b>Pre-Assessment:</b> <ul style="list-style-type: none"><li>• Students will identify the steps of the scientific method through an activity of teacher's choosing.</li></ul>	<b>Informal Assessment:</b> <ul style="list-style-type: none"><li>• Student Sample Work from Spongebob experiments</li></ul>	
<b>Post-Assessment:</b> <ul style="list-style-type: none"><li>• Scientific Method/Observation/Inference Test</li></ul>		
<b>Essential Vocabulary:</b> Problem, Hypothesis, Procedure, Variable, Constant, Data, Results, Conclusions, Observation, Inference, Independent Variable, Dependent Variable, Control, Qualitative Data, Quantitative Data		

<b>Course Name:</b> 7 <sup>th</sup> Grade Science		<b>Strand:</b> Earth Science: Earth Systems
<b>Unit Title:</b> Atmosphere		<b>Number of Days:</b> 43
<b>Essential Standard:</b> 7.E.1 Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth's atmosphere, weather and climate and the effects of the atmosphere on humans.		
<b>Clarifying Objective:</b> 7.E.1.1 – <b>Composition, Properties, &amp; Structure of Atmosphere</b> – Compare the composition, properties and structure of Earth's atmosphere to include: mixtures of gases and differences in temperature and pressure within layers. (8)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will identify and illustrate the layers of atmosphere.</li><li>• Students will examine the gases that compose the atmosphere.</li><li>• Students will examine the properties of the layers of the atmosphere.</li><li>• Students will compare and contrast the composition, properties and structure of the atmosphere.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• WRAL-TV <a href="http://www.wral.com">http://www.wral.com</a></li><li>• Weather Underground <a href="http://www.wunderground.com/">http://www.wunderground.com/</a></li><li>• NOAA <a href="http://www.noaa.gov/">http://www.noaa.gov/</a></li><li>• The Weather Channel <a href="http://www.weather.com/">http://www.weather.com/</a></li><li>• Earth's Atmosphere Labs <a href="http://sunshine.chpc.utah.edu/labs/atmosphere/atmosphere_main.html">http://sunshine.chpc.utah.edu/labs/atmosphere/atmosphere_main.html</a></li></ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> atmosphere, altitude, density, air pressure, barometer, troposphere, stratosphere, ozone, mesosphere, thermosphere, exosphere, convection, conduction, radiation (UV, infrared, visible), weather		

<b>Clarifying Objective: 7.E.1.2 – Water Cycle</b> - Explain how the cycling of water in and out of the atmosphere and atmospheric conditions relate to the weather patterns on Earth. (6)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will identify and illustrate the parts of the water cycle.</li><li>• Students will examine the factors that describe weather (clouds, temperature, air pressure, wind speed)</li><li>• Students will relate the water cycle to weather patterns on Earth.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Terrarium model <a href="http://teachnet.com/lessonplans/science/biology/terrariums-the-water-cycle/">http://teachnet.com/lessonplans/science/biology/terrariums-the-water-cycle/</a></li><li>• The Life of Wally the Water Drop <a href="http://prezi.com/tivfu9e-r84b/the-life-of-wally-the-water-drop/">http://prezi.com/tivfu9e-r84b/the-life-of-wally-the-water-drop/</a></li><li>• US Geologic Service, Water Science School <a href="http://ga.water.usgs.gov/edu/watercycle.html">http://ga.water.usgs.gov/edu/watercycle.html</a></li><li>• Scholastic Study Jams – Water Cycle <a href="http://teacher.scholastic.com/activities/studyjams/water_cycle/">http://teacher.scholastic.com/activities/studyjams/water_cycle/</a></li></ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> water cycle, evaporation, condensation, precipitation, weather, meteorology, cloud formation, radiation, runoff, transpiration		

<b>Clarifying Objective: 7.E.1.3 – Air Masses, Pressure Systems, and Boundaries</b> - Explain the relationship between the movement of air masses, high and low pressure systems, and frontal boundaries to storms (including thunderstorms, hurricanes, and tornadoes) and other weather conditions that may result. (8)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will describe and identify air masses.</li><li>• Students will define air pressure.</li><li>• Students will describe and illustrate frontal boundaries and the weather that results from each boundary.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• WRAL-TV <a href="http://www.wral.com">http://www.wral.com</a></li><li>• Weather Underground <a href="http://www.wunderground.com/">http://www.wunderground.com/</a></li><li>• NOAA <a href="http://www.noaa.gov/">http://www.noaa.gov/</a></li><li>• ClassZone Simulations</li><li>• Hurricane Tracking (current or historic)</li><li>• Nature’s Fury documentary</li><li>• Raging Planet videos</li><li>• Google Earth</li></ul> <p style="text-align: right;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> weather, troposphere, air masses, fronts, pressure systems, storms, precipitation, cumulonimbus		

<b>Clarifying Objective: 7.E.1.4 – Predict Weather Conditions / Patterns</b> – Predict weather conditions and patterns based on information obtained from: • Weather data collected from direct observations and measurement (wind speed and direction, air temperature, humidity and air pressure) • Weather maps, satellites and radar • Cloud shapes and types and associated elevation (9)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will collect weather data from direct observation and measurement.</li><li>• Students will read a weather map, satellite and radar picture.</li><li>• Students will identify cloud types.</li><li>• Students will predict weather conditions and patterns using all appropriate information.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• WRAL-TV <a href="http://www.wral.com">http://www.wral.com</a></li><li>• Weather Underground <a href="http://www.wunderground.com/">http://www.wunderground.com/</a></li><li>• NOAA <a href="http://www.noaa.gov/">http://www.noaa.gov/</a></li><li>• Weather Channel for Kids <a href="http://theweatherchannelkids.com/">http://theweatherchannelkids.com/</a></li><li>• EdHeads Weather predictions <a href="http://www.edheads.org/activities/weather/">http://www.edheads.org/activities/weather/</a></li><li>• Scholastic Weather Watch <a href="http://teacher.scholastic.com/activities/wwatch/">http://teacher.scholastic.com/activities/wwatch/</a></li></ul> <p style="text-align: right;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> forecasting, isobar, meteorology, satellite imagery, Doppler radar, prediction, cloud types, fronts & systems		

<b>Clarifying Objective: 7.E.1.5 – Convection, Global Winds, and Jet Stream – Explain the influence of convection, global winds and the jet stream on weather and climatic conditions. (5)</b>		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will describe convection.</li><li>• Students will explain and illustrate the global winds and jet stream.</li><li>• Students will explain how convection, global winds and the jet stream contribute to weather and climate conditions.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Global Winds Lab <a href="http://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=1&amp;ved=0CGYQFjAA&amp;url=http%3A%2F%2Fwww.csuchico.edu%2F~abykerk-kauffman%2Fcourses%2Fgeos142%2Fpacket%2Fpdf%2F65GlobalWindsLab.pdf&amp;ei=au7hT_euOZK08ATwqOiGCA&amp;usg=AFQjCNHBW48-kzxkG-eJSO9F324DcAO79g&amp;sig2=Fjb8XwV5dztev_wTQtCcMA">http://www.google.com/url?sa=t&amp;rct=j&amp;q=&amp;esrc=s&amp;source=web&amp;cd=1&amp;ved=0CGYQFjAA&amp;url=http%3A%2F%2Fwww.csuchico.edu%2F~abykerk-kauffman%2Fcourses%2Fgeos142%2Fpacket%2Fpdf%2F65GlobalWindsLab.pdf&amp;ei=au7hT_euOZK08ATwqOiGCA&amp;usg=AFQjCNHBW48-kzxkG-eJSO9F324DcAO79g&amp;sig2=Fjb8XwV5dztev_wTQtCcMA</a></li><li>• Convection Lab <a href="http://www.education.com/science-fair/article/convection-movement-heat-fluids/">http://www.education.com/science-fair/article/convection-movement-heat-fluids/</a></li><li>• Global Winds <a href="http://education.gsfc.nasa.gov/ess/Units/Unit2/U2L10A.html">http://education.gsfc.nasa.gov/ess/Units/Unit2/U2L10A.html</a></li><li>• Global Wind Patterns <a href="http://kids.earth.nasa.gov/archive/nino/global.html">http://kids.earth.nasa.gov/archive/nino/global.html</a></li></ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> global winds, convection, pressure gradient, calm regions, jet stream, Coriolis effect, climate, Gulf stream, El Nino, Monsoons, Sea breeze, Land breeze		

<b>Clarifying Objective: 7.E.1.6 – Monitoring Atmosphere / Stewardship – Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship. (5)</b>		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will recognize the importance of air quality to the survival of life on Earth.</li><li>• Students will describe human activities that influence air quality.</li><li>• Students will examine technology that is used to monitor air quality.</li><li>• Students will describe laws that control and reduce air pollution.</li><li>• Students will conclude that maintaining air quality is necessary for the good health of humans.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Ozone alerts</li><li>• UV beads and meter</li><li>• AirNow <a href="http://airnow.gov/">http://airnow.gov/</a></li><li>• EPA <a href="http://www.epa.gov/">http://www.epa.gov/</a></li><li>• NIEHS <a href="http://www.niehs.nih.gov/">http://www.niehs.nih.gov/</a></li><li>• McDougall Air Pollution investigation</li><li>• Inconvenient Truth DVD</li></ul> <p style="text-align: right;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> air pollution, ozone, CFCs, greenhouse effect, global warming, UV index, particulates, smog, fossil fuels, point source vs. non-point source, acid rain		

<b>Course Name:</b> 7 <sup>th</sup> Grade Science		<b>Strand:</b> Physical Science: Forces and Motion
<b>Unit Title:</b> Forces and Motion		<b>Number of Days:</b> 29
<b>Essential Standard:</b> 7.P.1 – Understand motion, the effects of forces on motion and the graphical representations of motion.		
<b>Clarifying Objective:</b> 7.P.1.1 – <b>Motion of an Object</b> – Explain how the motion of an object can be described by its position, direction of motion, and speed with respect to some other object. (7)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will describe an object’s motion using its position as a reference.</li><li>• Students will describe an object’s motion using its direction as a reference.</li><li>• Students will describe the motion of an object using its speed as a reference.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• BrainPop <a href="http://www.brainpop.com/">http://www.brainpop.com/</a></li><li>• Bubble Gum Physics <a href="http://sciencespot.net/Media/bgumphysics.pdf">http://sciencespot.net/Media/bgumphysics.pdf</a></li><li>• Vernier motion probes</li><li>• Forces and Motion Experiments <a href="http://www.stevespanglerscience.com/experiments/12">http://www.stevespanglerscience.com/experiments/12</a></li><li>• Forces and Motion Links <a href="http://www.science-class.net/Physics/force_motion.htm">http://www.science-class.net/Physics/force_motion.htm</a></li></ul> <p style="text-align: right;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> motion, position, reference point, frame of reference, relative motion, speed, velocity, acceleration, vector		



<b>Clarifying Objective: 7.P.1.3 – Change in Position Over Time - Illustrate the motion of an object using a graph to show a change in position over a period of time. (5)</b>		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will recognize that an object is in motion when its position changes.</li><li>• Students will collect and organize data about an object’s motion.</li><li>• Students will illustrate the motion of an object using a graph to show a change in position over time.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• BrainPop <a href="http://www.brainpop.com/">http://www.brainpop.com/</a></li><li>• Bubble Gum Physics <a href="http://sciencespot.net/Media/bgumphysics.pdf">http://sciencespot.net/Media/bgumphysics.pdf</a></li><li>• Vernier motion probes</li><li>• Forces and Motion Experiments <a href="http://www.stevespanglerscience.com/experiments/12">http://www.stevespanglerscience.com/experiments/12</a></li><li>• Forces and Motion Links <a href="http://www.science-class.net/Physics/force_motion.htm">http://www.science-class.net/Physics/force_motion.htm</a></li></ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> motion, position, reference point, frame of reference, relative motion, speed, velocity, acceleration, vector		

<b>Clarifying Objective: 7.P.1.4 – Distance vs. Time – Interpret distance versus time graphs for constant speed and variable motion. (5)</b>		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will recognize the graph of the constant speed of an object.</li><li>• Students will recognize the graph of variable motion of an object.</li><li>• Students will interpret distance versus time graphs for constant speed and variable motion.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• BrainPop <a href="http://www.brainpop.com/">http://www.brainpop.com/</a></li><li>• Bubble Gum Physics <a href="http://sciencespot.net/Media/bgumphysics.pdf">http://sciencespot.net/Media/bgumphysics.pdf</a></li><li>• Vernier motion probes</li><li>• Forces and Motion Experiments <a href="http://www.stevespanglerscience.com/experiments/12">http://www.stevespanglerscience.com/experiments/12</a></li><li>• Forces and Motion Links <a href="http://www.science-class.net/Physics/force_motion.htm">http://www.science-class.net/Physics/force_motion.htm</a></li></ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> motion, position, reference point, frame of reference, relative motion, speed, velocity, acceleration, vector		

**Clarifying Objective: 7.P.1.2 – Balanced and Unbalanced Forces – Explain the effects of balanced and unbalanced forces acting on an object (including friction, gravity and magnets). (9)**

**Student Friendly Objectives:**

- Students will define and illustrate balanced and unbalanced forces.
- Students will define friction and explain its effect on balanced and unbalanced forces.
- Students will define gravity and explain its effect on balanced and unbalanced forces.
- Students will explain how magnets affect the balanced and unbalanced forces acting on an object.

**Assessment/Evidence of Proficiency:**

Pre-Assessment:

Informal Assessment:

Post-Assessment:

**Instructional Strategies/ Resources/Informational Technology Integration:**

- BrainPop <http://www.brainpop.com/>
- Bubble Gum Physics <http://sciencespot.net/Media/bgumphysics.pdf>
- Vernier motion probes
- Forces and Motion Experiments <http://www.stevespanglerscience.com/experiments/12>
- Forces and Motion Links [http://www.science-class.net/Physics/force\\_motion.htm](http://www.science-class.net/Physics/force_motion.htm)

*See Science Wiki for documents and more activities/resources.*

**Essential Vocabulary:** Balanced and unbalanced forces, net force, Newton's Laws of Motion, inertia, friction, air resistance, Newtons (kg-m), Sir Isaac Newton, gravity, weight vs. mass, magnets

<b>Course Name:</b> 7 <sup>th</sup> Grade Science		<b>Strand:</b> Physical Science: Energy
<b>Unit Title:</b> Energy: Conservation/Transfer		<b>Number of Days:</b> 20
<b>Essential Standard:</b> 7.P.2 Understand forms of energy, energy transfer and transformation and conservation in mechanical systems.		
<b>Clarifying Objective:</b> 7.P.2.1 – Kinetic vs. Potential Energy – Explain how kinetic and potential energy contribute to the mechanical energy of an object. (4)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will define and illustrate kinetic and potential energy.</li><li>• Students will explain mechanical energy.</li><li>• Students will illustrate how kinetic and potential energy contribute to mechanical energy.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• BrainPop <a href="http://www.brainpop.com/">http://www.brainpop.com/</a></li><li>• Bubble Gum Physics <a href="http://sciencespot.net/Media/bgumphysics.pdf">http://sciencespot.net/Media/bgumphysics.pdf</a></li><li>• Forces and Motion Experiments <a href="http://www.stevespanglerscience.com/experiments/12">http://www.stevespanglerscience.com/experiments/12</a></li><li>• Forces and Motion Links <a href="http://www.science-class.net/Physics/force_motion.htm">http://www.science-class.net/Physics/force_motion.htm</a></li><li>• Phet Website <a href="http://phet.colorado.edu/">http://phet.colorado.edu/</a></li><li>• Discovery Education Science <a href="http://www.discoveryeducation.com/">http://www.discoveryeducation.com/</a></li><li>• Roller Coaster Simulations <a href="http://synergyscience.wordpress.com/2009/11/02/roller-coaster-simulations/">http://synergyscience.wordpress.com/2009/11/02/roller-coaster-simulations/</a> <i>See Science Wiki for documents and more activities/resources.</i></li></ul>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		

<b>Essential Vocabulary:</b> kinetic energy, potential energy, work (joule), mechanical energy		
<b>Clarifying Objective 7.P.2.2 – Energy Transformation Modeling –</b> Explain how energy can be transformed from one form to another (specifically potential energy and kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples). (4)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will recognize that energy changes forms but is never lost.</li><li>• Students will examine the transfer of energy from one object to another.</li><li>• Students will model the transformation of energy in a moving object.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• BrainPop <a href="http://www.brainpop.com/">http://www.brainpop.com/</a></li><li>• Bubble Gum Physics <a href="http://sciencespot.net/Media/bgumphysics.pdf">http://sciencespot.net/Media/bgumphysics.pdf</a></li><li>• Forces and Motion Experiments <a href="http://www.stevespanglerscience.com/experiments/12">http://www.stevespanglerscience.com/experiments/12</a></li><li>• Forces and Motion Links <a href="http://www.science-class.net/Physics/force_motion.htm">http://www.science-class.net/Physics/force_motion.htm</a></li><li>• Phet Website <a href="http://phet.colorado.edu/">http://phet.colorado.edu/</a></li><li>• Discovery Education Science <a href="http://www.discoveryeducation.com/">http://www.discoveryeducation.com/</a></li><li>• Roller Coaster Simulations <a href="http://synergyscience.wordpress.com/2009/11/02/roller-coaster-simulations/">http://synergyscience.wordpress.com/2009/11/02/roller-coaster-simulations/</a> <i>See Science Wiki for documents and more activities/resources.</i></li></ul>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> energy transfer, energy transformation, kinetic energy, potential energy, conservation of energy		

**Clarifying Objective 7.P.2.3 – Energy Transfer: Work and Electricity** – Recognize that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) and electrical circuits require a complete loop through which an electrical current can pass. (5)

**Student Friendly Objectives:**

- Students will describe the energy transfer that takes place when work has been done.
- Students will describe the energy transfer in electrical circuits.
- Students will explain why electrical circuits require a complete loop to transfer energy.
- Students will understand that all energy conversions create some amount of heat.

**Assessment/Evidence of Proficiency:**

Pre-Assessment:

Informal Assessment:

Post-Assessment:

**Instructional Strategies/ Resources/Informational Technology Integration:**

- Guide to Electric Circuits (game)  
<http://www.andythelwell.com/blobz/>
- Hands on usage with Batteries, Lightbulbs and Wires
- Middle School Electricity Unit  
<http://www.kirkwoodschools.org/faculty/mcgeechelectricity/>
- Electricity Guide - Fuel Cells  
[http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=9&ved=0CHgQFjAl&url=http%3A%2F%2Fwww1.eere.energy.gov%2Fhydrogenandfuelcells%2Feducation%2Fpdfs%2Factivity\\_guide.pdf&ei=QmYqUK-tJoKc8QTHi4DoDQ&usg=AFQjCNHQVMR9t6EP0ZuE3JTXapO8O5g0tw&sig2=-0XfX30vLTEZb88YpYkEuQ&cad=rja](http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=9&ved=0CHgQFjAl&url=http%3A%2F%2Fwww1.eere.energy.gov%2Fhydrogenandfuelcells%2Feducation%2Fpdfs%2Factivity_guide.pdf&ei=QmYqUK-tJoKc8QTHi4DoDQ&usg=AFQjCNHQVMR9t6EP0ZuE3JTXapO8O5g0tw&sig2=-0XfX30vLTEZb88YpYkEuQ&cad=rja)  
*See Science Wiki for documents and more activities/resources.*

**Essential Vocabulary:** circuit, power (watt), work (joule), current (amps)

**Clarifying Objective 7.P.2.4 – Simple Machines/Mechanical Advantage** – Explain how simple machines such as inclined planes, pulleys, levers and wheel and axles are used to create mechanical advantage and increase efficiency.  
(5)

**Student Friendly Objectives:**

- Students will examine types of simple machines.
- Students will define mechanical advantage.
- Students will define energy efficiency.
- Students will evaluate the mechanical advantage and efficiency of simple machines.

**Assessment/Evidence of Proficiency:**

Pre-Assessment:

Informal Assessment:

Post-Assessment:

**Instructional Strategies/ Resources/Informational Technology Integration:**

- Simple Machines  
<http://www.edheads.org/activities/simple-machines/>
- Simple Machines Game – University of Chicago  
[http://www.msichicago.org/fileadmin/Activities/Games/simple\\_machines//](http://www.msichicago.org/fileadmin/Activities/Games/simple_machines//)
- Simple Machines – List of Resources  
<http://edtech.kennesaw.edu/web/simmach.html>

*See Science Wiki for documents and more activities/resources.*

**Essential Vocabulary:** simple machine, inclined plane, pulleys, levers, fulcrum, wheel-and-axel, mechanical advantage, efficiency, compound machine

<b>Course Name:</b> 7 <sup>th</sup> Grade Science		<b>Strand:</b> Life Science: Living Organisms
<b>Unit Title:</b> Living Organisms		<b>Number of Days:</b> 40
<b>Essential Standard:</b> 7.L.1 – Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.		
<b>Clarifying Objective 7.L.1.1 – Single-celled Organisms</b> – Compare the structures and life functions of single-celled organisms that carry out all of the basic functions of life including: • Euglena • Amoeba • Paramecium • Volvox (5)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will recognize that organisms are classified into six kingdoms, including organisms not visible to the human eye.</li><li>• Students will understand that microorganisms are capable of the basic life functions such as moving, taking in food, reproducing, and detecting their environments.</li><li>• Students will illustrate the structures of single-celled organisms.</li><li>• Students will compare single-celled organisms based on their structures and life functions.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Virtual Pond Dip <a href="http://www.microscopy-uk.org.uk/index.html?http://www.microscopy-uk.org.uk/pondip/index.html">http://www.microscopy-uk.org.uk/index.html?http://www.microscopy-uk.org.uk/pondip/index.html</a></li><li>• Six Kingdoms of Life Resources <a href="http://www.putnamscienceonline.com/6kingdomsoflife.htm">http://www.putnamscienceonline.com/6kingdomsoflife.htm</a></li><li>• Middle School Life Science Links <a href="http://www.middleschoolscience.com/life.htm">http://www.middleschoolscience.com/life.htm</a></li><li>• Science Spot Biology Links <a href="http://www.sciencespot.net/Pages/classbio.html">http://www.sciencespot.net/Pages/classbio.html</a> <i>See Science Wiki for documents and more activities/resources.</i></li></ul>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> cell, unicellular, multicellular, organism, asexual reproduction, protists		



<b>Clarifying Objective 7.L.1.2 – Plant and Animal Cells – Compare the structures and functions of plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, chloroplasts, mitochondria, and vacuoles). (10)</b>		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will understand that all living things are composed of cells.</li><li>• Students will recognize that the cell and its organelles are only visible using a microscope.</li><li>• Students will describe the functions of organelles of plant and animal cells.</li><li>• Students will compare plant and animal cells based on their structures and functions.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Cell Links <a href="http://classroom.jc-schools.net/sci-units/cells.htm">http://classroom.jc-schools.net/sci-units/cells.htm</a></li><li>• Interactive Cells - Cells Alive <a href="http://www.cellsalive.com/cells/cell_model.htm">http://www.cellsalive.com/cells/cell_model.htm</a></li><li>• Middle School Life Science Links <a href="http://www.middleschoolscience.com/life.htm">http://www.middleschoolscience.com/life.htm</a></li><li>• Science Spot Biology Links <a href="http://www.sciencespot.net/Pages/classbio.html">http://www.sciencespot.net/Pages/classbio.html</a></li></ul> <p><i>See Science Wiki for documents and more activities/resources.</i></p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> organelle, cell membrane, cell wall, nucleus, chloroplasts, mitochondria, vacuoles, cytoplasm		
<b>Clarifying Objective 7.L.1.3 – Hierarchical Organization – Summarize the hierarchical organization of multi-cellular organisms from cells to tissues to organs to systems to organisms. (4)</b>		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will recognize that groups of specialized cells form tissues, which perform specialized functions.</li><li>• Students will recognize that tissues are grouped together into organs.</li><li>• Students will recognize that organs are grouped together into organ systems.</li></ul>		

<ul style="list-style-type: none"><li>• Students will recognize that organ systems work together to maintain living organisms.</li><li>• Students will summarize the hierarchical organization of multi-cellular organisms.</li></ul>	
<b>Assessment/Evidence of Proficiency:</b>	
Pre-Assessment:	Informal Assessment:
Post-Assessment:	
<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Life Science Curriculum Links <a href="http://www.shellyssciencepot.com/Curriculum.htm">http://www.shellyssciencepot.com/Curriculum.htm</a></li><li>• Cell to Organisms Quizlet Cards <a href="http://quizlet.com/3891229/cells-tissues-organs-organ-systems-organisms-flash-cards/">http://quizlet.com/3891229/cells-tissues-organs-organ-systems-organisms-flash-cards/</a></li><li>• Cell to Tissue Links <a href="http://msteacher.org/epubs/science/science15/cellstissues.aspx">http://msteacher.org/epubs/science/science15/cellstissues.aspx</a></li><li>• Middle School Life Science Links <a href="http://www.middleschoolscience.com/life.htm">http://www.middleschoolscience.com/life.htm</a></li><li>• Science Spot Biology Links <a href="http://www.sciencespot.net/Pages/classbio.html">http://www.sciencespot.net/Pages/classbio.html</a></li></ul> <p style="text-align: center;"><i>See Science Wiki for documents and more activities/resources.</i></p>	
<b>Essential Vocabulary:</b> cells, tissues, organs, organ system, organism, ecosystems	
<b>Clarifying Objective 7.L.1.4 – Human Body Systems</b> – Summarize the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, and excretion) and ways that these systems interact with each other to sustain life. (18)	
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will examine the processes that are needed to support life in humans.</li><li>• Students will relate the organ systems to their functions.</li><li>• Students will summarize how organ systems work together to support life.</li></ul>	

- Students will conclude that human health can suffer if the body systems are not in balance.

Assessment/Evidence of Proficiency:		Instructional Strategies/ Resources/Informational Technology Integration:
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
		<ul style="list-style-type: none"><li>• Organ System Links <a href="http://msteacher.org/epubs/science/science24/lessons.aspx">http://msteacher.org/epubs/science/science24/lessons.aspx</a></li><li>• Organ Systems: <a href="http://peer.tamu.edu/curriculum_modules/organsystems/index.htm">http://peer.tamu.edu/curriculum_modules/organsystems/index.htm</a></li><li>• Virtual Dissection Links <a href="http://biology.about.com/od/onlineDissections/a/aa112805a.htm">http://biology.about.com/od/onlineDissections/a/aa112805a.htm</a></li><li>• Middle School Life Science Links <a href="http://www.middleschoolscience.com/life.htm">http://www.middleschoolscience.com/life.htm</a></li><li>• Science Spot Biology Links <a href="http://www.sciencespot.net/Pages/classbio.html">http://www.sciencespot.net/Pages/classbio.html</a></li></ul> <p><i>See Science Wiki for documents and more activities/resources.</i></p>
<b>Essential Vocabulary:</b> homeostasis, digestion, reproduction, respiration, circulation, excretion, protection		

<b>Course Name:</b> 7 <sup>th</sup> Grade Science		<b>Strand:</b> Life Science: Evolution and Genetics
<b>Unit Title:</b> Evolution and Genetics		<b>Number of Days:</b> 25
<b>Essential Standard:</b> 7.L.2 – Understand the relationship of the mechanisms of cellular reproduction, patterns of inheritance and external factors to potential variation among offspring.		
<b>Clarifying Objective 7.L.2.1 – Sexual and Asexual Reproduction</b> – Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis). (9)		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will describe sexual reproduction.</li><li>• Students will describe asexual reproduction.</li><li>• Students will compare sexual and asexual reproduction.</li><li>• Students will support that offspring resulting from sexual reproduction have greater variation than offspring resulting from asexual reproduction.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Reproduction information <a href="http://trackstar.4teachers.org/trackstar/ts/viewTrack.do?number=279601">http://trackstar.4teachers.org/trackstar/ts/viewTrack.do?number=279601</a></li><li>• Middle School Life Science Links <a href="http://www.middleschoolscience.com/life.htm">http://www.middleschoolscience.com/life.htm</a></li><li>• Science Spot Biology Links <a href="http://www.sciencespot.net/Pages/classbio.html">http://www.sciencespot.net/Pages/classbio.html</a></li></ul> <p>See Science Wiki for documents and more activities/resources.</p>
Pre-Assessment:	Informal Assessment:	
Post-Assessment:		
<b>Essential Vocabulary:</b> sexual reproduction, fertilization, meiosis, gametes, asexual reproduction, budding, mitosis		

**Clarifying Objective 7.L.2.2 – Punnett Squares and Pedigrees – Infer patterns of heredity using information from Punnett squares and pedigree analysis. (7)**

**Student Friendly Objectives:**

- Students will create Punnett squares based on genetic information.
- Students will inspect Punnett squares for accuracy.
- Students will summarize the genetic information gained from pedigrees.
- Students will predict patterns of heredity using information from Punnett squares and pedigree analysis.

**Assessment/Evidence of Proficiency:**

Pre-Assessment:

Informal Assessment:

Post-Assessment:

**Instructional Strategies/ Resources/Informational Technology Integration:**

- Genetic Links/Punnett Squares  
[http://www.vrml.k12.la.us/7th/7SC\\_By\\_Unit/unit6/act5/7SC\\_Un6Act5.htm](http://www.vrml.k12.la.us/7th/7SC_By_Unit/unit6/act5/7SC_Un6Act5.htm)
- Punnett Squares and Pedigree Links  
<http://www.rhnet.org/webpages/mhenderson1/inheritance-1.cfm?subpage=47521>
- Genetics Games (variety)  
<http://comelearnmore.com/websites-by-topic/genetics-games/>
- Interactive Pedigree [http://highered.mcgraw-hill.com/sites/0072485949/student\\_view0/chapter3/interactive\\_activity.html](http://highered.mcgraw-hill.com/sites/0072485949/student_view0/chapter3/interactive_activity.html)
- Middle School Life Science Links  
<http://www.middleschoolscience.com/life.htm>
- Science Spot Biology Links  
<http://www.sciencespot.net/Pages/classbio.html>

*See Science Wiki for documents and more activities/resources*

**Essential Vocabulary:** Genetics, heredity, DNA, genes, chromosomes, traits, Punnett squares, Dominant and Recessive, Genotype and Phenotype, Gregor Mendel, Pedigree, Breeding, Genetic engineering, GMOs

<b>Clarifying Objective 7.L.2.3 – Biological Inheritance and Survival – Explain the impact of the environment and lifestyle choices on biological inheritance (to include common genetic diseases) and survival. (7)</b>		
<b>Student Friendly Objectives:</b> <ul style="list-style-type: none"><li>• Students will recognize that some individuals are more likely than others to survive and reproduce.</li><li>• Students will compare diseases that are biologically inherited to those that are caused by environmental stressors.</li><li>• Students will evaluate the effect of lifestyle choices and environment on biological inheritance and survival.</li></ul>		
<b>Assessment/Evidence of Proficiency:</b>		<b>Instructional Strategies/ Resources/Informational Technology Integration:</b> <ul style="list-style-type: none"><li>• Genetic Lessons <a href="http://www.kumc.edu/gec/lessons.html">http://www.kumc.edu/gec/lessons.html</a></li><li>• Genetic Disorders Webquest <a href="http://mset.rst2.edu/portfolios/d/deblock_m/toolsdev/checkpoints/finalproject/index.htm">http://mset.rst2.edu/portfolios/d/deblock_m/toolsdev/checkpoints/finalproject/index.htm</a></li><li>• Links for different Genetic Diseases <a href="http://ms-tcsd-ny.schoolloop.com/cms/page_view?d=x&amp;piid=&amp;vpid=1335782941534">http://ms-tcsd-ny.schoolloop.com/cms/page_view?d=x&amp;piid=&amp;vpid=1335782941534</a></li><li>• Middle School Life Science Links <a href="http://www.middleschoolscience.com/life.htm">http://www.middleschoolscience.com/life.htm</a></li><li>• Science Spot Biology Links <a href="http://www.sciencespot.net/Pages/classbio.html">http://www.sciencespot.net/Pages/classbio.html</a> <i>See Science Wiki for documents and more activities/resources</i></li></ul>
Pre-Assessment	Informal Assessment	
Post-Assessment		
<b>Essential Vocabulary:</b> genetic disorders, mutation, carcinogens, cancer, nature vs. nurture, genetic counseling		